CLAIMS

What is claimed is:

1. A method of manufacturing a semiconductor device comprising the steps of:

a) providing an organic semiconductor layer;

b) depositing a reactive species on a portion of the organic semiconductor layer; and

c) reacting the reactive species with the portion of the organic layer to form a dielectric layer.

2. The method of claim 1 wherein reacting comprises one of oxidizing, reducing or isomerizing.

3. The method of claim 1 wherein the dielectric layer is a gate dielectric layer.

4. The method of claim 3 wherein step a) further comprises the steps of a1) providing a gate electrode and a2) providing the reactive species on the gate electrode.

5. The method of claim 1 wherein the reactive species comprises one of a liquid, a solid, or a suspension.

6. The method of claim 1 wherein the dielectric layer comprises an insulating layer of a thin film transistor.

7. The method of claim 1 wherein the semiconductor device is part of a circuit for addressing an electronic display.

8. A method of manufacturing a semiconductor device comprising the steps of:

a) providing an organic semiconductor layer; and

b) exposing a surface of the organic semiconductor layer to a radiation to form a dielectric layer.

9. The method of claim 9 wherein the radiation is electron beam or electromagnetic radiation.

10. The method of claim 10 wherein the radiation is ultraviolet electromagnetic radiation.

11. A method of manufacturing a transistor comprising the steps of:

a) providing an organic semiconductor layer adjacent a gate electrode;

b) providing an electrochemical cell wherein the gate electrode is an electrode of the electrochemical cell; and

c) applying a voltage to the gate electrode to cause an electrochemical reaction to form a gate dielectric between the gate electrode and the organic semiconductor layer.

12. A method of protecting organic layers in an electronic device, comprising the steps of:

a) providing a first organic layer;

b) providing a barrier layer adjacent to the first organic layer, wherein the barrier layer is resistant to a solvent; and

c) providing a solution or a dispersion comprising the solvent and a layer-forming material adjacent to the first organic layer.

13. The method of claim 13 wherein the first organic layer comprises one of a polymeric substrate, a semiconductor, a dielectric, and a conductor.

14. The method of claim 13 wherein the solution or the dispersion comprises an ink and further comprising the step of:

d) forming from the ink a second layer comprising a semiconductor, a conductor, or a dielectric.

15. The method of claim 13 wherein the solution or the dispersion comprises an ink and further comprising the step of:

d) forming from the ink a second layer comprising a semiconductor, wherein the semiconductor has a preferred domain structure due to the influence of the dielectric layer on the formation of the semiconductor layer.

16. The method of claim 16 wherein the preferred domain structure comprises one or more of large domains, domains with a preferred orientation, and domains with a preferred direction.

17. The method of claim 13 wherein step (c) is a patterning step.

18. The method of claim 13 wherein the barrier layer comprises one of silicon nitride, silica, alumina, poly(meth)acrylates, polyurethanes or polyvinyl alcohol.

19. The method of claim 13 wherein the barrier layer comprises one of an insulator, a semiconductor, or a conductor.

20. The method of claim 13 wherein a thickness of the barrier layer is about one tenth a thickness of the first organic layer.

21. The method of claim 13 wherein a thickness of the barrier layer is in the range of 10nm to 50nm.

22. The method of claim 13 wherein step (b) further comprises depositing the barrier layer by one or more from a set comprising chemical vapor deposition, ion-milling, sputtering, gas-phase deposition, spin-coating, and printing.